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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,803	09/09/2003	Partho Sarkar	2281-1-3	1819

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EXAMINER	
ALEJANDRO, RAYMOND	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/658,803	SARKAR ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This office action is responsive to the amendment filed on 05/15/06. The applicant has only overcome the objections and the 35 USC 112 rejection. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments and remarks. However, the present claims are finally rejected as the 35 USC 102 and 35 USC 103 rejections still stand for the reasons of record. Rejections based upon the same already cited references follow:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-9 and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Shibata et al 2002/0164523.

The present application is directed to an anode-supported solid oxide fuel cell wherein the disclosed inventive concept comprises the specific anode support layer.

As to claims 1 and 12:

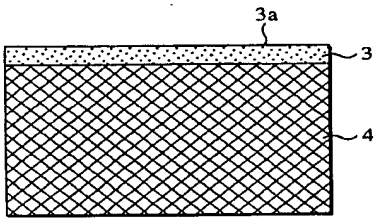
Shibata et al disclose a unit cell for a solid electrolyte fuel cell including an air electrode, a fuel electrode and a solid electrolyte sandwiched therebetween, and a porous metallic base body joined at least one of the air electrode and the fuel electrode (ABSTRACT). The porous

metallic base body serves to pass fuel gas to be supplied to the fuel electrode while allowing a cell power output to be collector from a reacting area (ABSTRACT). The solid oxide electrolyte is also disclosed (P. 0002).

Shibata et al further disclose that porous metallic base body is formed of a laminated body that includes more than two (2) layers of porous base body layers of the same kinds having different porosity rates or of the different kinds (P. 0047). It is disclosed that the layers provide the supporting and gas-flow passage functions (P. 0047/CLAIM 1). *Thus, the layers must have vias extending through the thickness dimension.*

Figure 7 illustrates the porous metallic base body taking the form of a laminated structure that includes a first surface layer, having an electrode forming layer 3a, adapted to be held in contact with an associated electrode, and a second surface layer 4 with is porosity rate different from that of the first surface layer (P. 0047).

FIG.7



Disclosed is that the porous metallic base body is made of nickel, silver and a W-based alloy and/or alloy thereof (P. 0044). *Thus, the porous metallic base body does contain a catalytic and electronically conductive material.*

As to claim 2:

Disclosed is that the porous metallic base body is made of nickel, silver and a W-based alloy and/or alloy thereof (P. 0044). *Thus, the porous metallic base body does contain a catalytic and electronically conductive material.*

As to claim 3:

Shibata et al teach the use of ceramic which is plated with the above metals or alloy thereof to make the porous metallic base body (P. 0044). **EXAMPLE 1** shows the combined use of a ceramic (alumina) with Ni (See EXAMPLE 1).

As to claim 4:

Shibata et al disclose a unit cell for a solid electrolyte fuel cell including an air electrode, a fuel electrode and a solid electrolyte sandwiched therebetween, and a porous metallic base body joined at least one of the air electrode and the fuel electrode (ABSTRACT).

As to claims 5-6:

Shibata et al show in **EXAMPLE 1** that the fuel electrode along with the porous metallic base body contains Ni-8%YSZ (See EXAMPLE 1). *Thus, anode support layer structure, as a whole, contains the claimed material uniformly distributed throughout the anode itself.*

As to claims 7-8:

Disclosed is that the porous metallic base body is made of nickel, silver and a W-based alloy and/or alloy thereof (P. 0044). *Thus, the porous metallic base body does contain a catalytic and electronically conductive material.*

Shibata et al further disclose that porous metallic base body is formed of a laminated body that includes more than two (2) layers of porous base body layers of the same kinds having

different porosity rates or of the different kinds (P. 0047). *The difference in porosity is associated with gradient concentration of the materials forming the porous metallic base body.*

As to claims 9 and 13:

Shibata et al show in **EXAMPLE 1** that the fuel electrode along with the porous metallic base body contains Ni-8%YSZ (See EXAMPLE 1). *Thus, anode support layer structure, as a whole, contains the claimed material uniformly distributed throughout the anode itself.*

Additionally, **Figures 10A and 10B** illustrates porous base bodies 1 and 2 comprising surface layers having pore rates of 60 %, 50 %, 70 %, 74 % and even 92 % (See Figures 10A-B). *Hence, Shibata et al provides specific guidance about the porosity of the layers comprising the porous base bodies.*

As to claim 11:

It is disclosed that the layers provide the supporting and gas-flow passage functions (P. 0047/CLAIM 1). *Thus, the layers must have vias extending through the thickness dimension.*

Thus, the present claims have been anticipated.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 7-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibata et al 2002/0164523 as applied to claim 4 above, and further in view of Sammes et al 2002/0028367.

Shibata et al is applied, argued and incorporated herein for the reasons above. However, Shibata et al does not expressly disclose the specific amount of the nickel-based material; and the specific gradient of Ni concentration.

As to claims 7-8:

Sammes et al disclose an electrode-supported solid state electrochemical cell (TITLE) being an anode-supported solid oxide fuel cell having (ABSTRACT). Disclosed is that each of the anode layers may comprise a ratio of electrochemically active substance to electrolyte substance, with such ratios being higher for layers that are layered further from a surface of the anode that contacts a fuel gas than for layers that are layered closer to the fuel gas (P. 0012). The support layer may comprise a higher ratio of YSZ to nickel, and the active layer may comprise a lower ratio (P. 0017, 0059-0060/ FIGURE 4)

As to claim 10:

Sammes et al specifically disclose that the layer may comprise from 0-50 % volume of nickel (P. 0017). **FIGURE 4** shows with sufficient specificity Ni volume percents ranging from

much greater than 0 % vol to much less than 100 % vol, and specifically, from 10-30 % vol (See FIGURE 4). *Thus, Figure 4 provides specific guidance as to the amount of Ni.*

In view of the above, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the specific amount of the nickel-based material of Sammes et al in the porous metallic base body of Shibata et al as Sammes et al disclose that the specific amount of Ni is necessary to maintain a satisfactory degree of electrochemical activity. That is, to obtain a solid oxide fuel cell with a higher electrochemical activity.

As to the specific gradient of Ni concentration, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the specific gradient of Ni concentration of Sammes et al in the porous metallic base body of Shibata et al as Sammes et al teach that such Ni concentration gradient is effective to produce high electrochemical activity while matching the thermal characteristics of the electrolyte layer. Thus, such Ni concentration gradient provides a compositional balance from one layer to another so as to prevent the nickel layer from splitting away from the electrolyte layer upon heating while also maintaining suitable electrochemical activity through the layers.

Response to Arguments

6. Applicant's arguments filed 05/15/06 have been fully considered but they are not persuasive.

7. The main contention of applicant's arguments focuses primarily on the assertion that "*In Shibata et al, the nickel and/or ceramic material is integrally formed into the base body; therefore one would expect a cross-sectional micrograph of the base body to reveal or structure*

with a porous homogeneous composition. In contrast, a micrograph of an anode-support layer as presently claimed will reveal a porous structure (for example, YSZ) having at least some of the pores filled with a catalytic and electronically conductive material (for example, nickel, copper, silver, tungsten). In other words, the anode support layer has a non-homogeneous structure". However, this assertion is not sufficient to overcome the prior art of record for the reasons that follow. First, in paragraph bridging pages 7-8, applicant admitted on the record that "*In Shibata et al, the nickel and/or ceramic material is integrally formed into the base body*". Thus, applicant's admission implies that the base body and nickel and/or ceramic material (the catalytic material or conductive material) of Shibata et al are in direct physical contact, in the same manner that applicant's catalytic/conductive material and porous structure is. As such, the specific method of making it (i.e. by impregnation) adds nothing of significance to the present product claims in the absence of objective evidence demonstrating that such a method produces a product exhibiting either superior characteristics and/or a different unobvious structure.

In this respect, although applicants are entitled to define a product by using particular process/method limitations, what is given patentably consideration is the product itself and not the manner in which the product was made. In this case, the references are teaching substantially the same product and constituents as the product made by the method of the instant claims. Therefore, the patentability of a product is independent of how it was made. Thus, burden is on applicants to show differences in product-by-process claims as well as in product comparisons. Further, even though the prior are may fail to disclose other physical properties, in view of the substantially similar products being disclosed in the instant application, the examiner has a reasonable basis to suspect that the claimed product and Shibata et al products would be

substantially the same. Since PTO does not have proper equipment to carry out the analytical tests, the burden is then shifted to applicants to provide objective evidence demonstrating the claimed product is necessarily different from the prior art's product, and that the difference is unobvious ***(Refer to MPEP 2113: Produc-by-Process Claims)***.

(***Emphasis supplied→***) Accordingly, the examiner also asserts that it is not enough that applicant's representative personally believes that "*one would expect a cross-sectional micrograph of the base body to reveal a structure with a porous homogeneous composition*" rather than a non-homogenous structure as the inventive anode support layer. That is to say, the arguments of counsel cannot take the place of evidence in the record. An assertion of what seems to follow from common experience is just attorney argument and not the kind of factual evidence that is required to rebut a prima facie case of inherent anticipation/obviousness (See ***MPEP 716.01 and 2145: Consideration of Applicant's Rebuttal Arguments***).

8. Additionally, the examiner wishes to mention that the term "*impregnated*" stands for either being filled or saturated (to cause to be filled or saturated) as defined by Merriam-Webster's Collegiate Dictionary (10th Edition). Therefore, applicant's recitation that "*the anode support layer comprising a porous ion-conducting structure having pores impregnated with a catalytic and electronically conductive material*" merely requires that the pores of applicant's anode support layer be filled with the catalytic/electronically material. Hence, since applicant has admitted on the record that "*In Shibata et al, the nickel and/or ceramic material is integrally formed into the base body*", it is emphatically averred that Shibata et al's porous structure is also filled with either nickel and/or ceramic material. To that extent, Shibata et al's porous-filled

anode support structure provides the necessary structural interrelationship to satisfy the claimed requirement.

9. Applicant has also contended on page 8 (last full paragraph) that "*there is no disclosure of any vias that are filled with electronically conductive material*". In response, applicant is reminded that nickel (Ni) is a conductive metallic material (element) and that applicant's specific electronically conductive material is not presently recited in the independent claim 12. Thus, such a conductive metallic material (Ni) disclosed by Shibata et al in combination with the silence of independent claim 12 to clearly set forth the specific electronically conductive material leads the examiner to rebut such a contention by simply pointing out that the nickel material of Shibata et al satisfy the claimed requirement.

10. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a) "*specific electronically conductive material*"; b) "*Shibata does not disclose the existence of vias or channels*") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). *This is to address applicant's intention to equate the word "vias" to "channels" in terms of structure and functionality.*

11. In response to applicant's argument that "*While Example 1 discloses an electrode 10 having a nickel-zirconia composition, the porous base body 1 is made of a different material. Paragraph 69 of Shibata et al discloses the porous base body 1 to include a ceramic (alumina) body plated with Ni*", the examiner rebuts applicant's arguments by stating that applicant is overlooking the fact that paragraph 0069 of Shibata et al discusses that "*the porous base body 1*

includes a ceramic body with Ni and is coated with the electrode material (Ni-8%-YSZ)" (←***emphasis supplied***). Therefore, the electrode coating is deposited into the pores of the porous base body of Shibata et al. Hence, Shibata et al' porous base body contains portions of electrode material therein and that electrode material is interpreted by the examiner to constitute applicant's cermet buffer layer. Applicant is again reminded that the language of the present claims do not exclude using the same electrode material for adding or disposing additional "buffer layers". Moreover, paragraph 0047 of Shibata et al directly teach to use laminated bodies including more than two (2) layers. More significantly, Shibata et al discloses in paragraph 0047 that "*Here, the porous metallic base body layer covered with the air electrode and/or the fuel electrode is referred to as the first surface layer*". As a consequence, it is further contended that Shibata et al at once envisage a laminated structure having multiple layers including a layer made of an electrode material deposited over the metallic base body. As such, that at-once-envisaged combination of teachings including at least one layer of the electrode material is taken by the examiner to represent applicant's "buffer layer".

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raymond Alejandro
Primary Examiner
Art Unit 1745